

## CLAIMS

1. A pad assembly for an exercise machine, comprising:  
a compressible layer having a first surface adapted to engage a portion of a user's body and a second surface opposite from the first surface; and  
a backing member having a non-planar surface engaged with the second surface of the compressible layer.
2. The pad assembly of claim 1 wherein the backing member comprises a contoured support attached to the second surface.
3. The pad assembly of claim 1 wherein the non-planar surface comprises a contoured portion that provides a compressed shape of the compressible layer that approximately corresponds with an anticipated shape of the portion of the user's body.
4. The pad assembly of claim 1 wherein the non-planar surface comprises a contoured portion having a radius of curvature within the range from approximately 1.5 inches to approximately 7.0 inches.
5. The pad assembly of claim 1 wherein the first surface comprises a concave portion adapted to engage a portion of the user's body.
6. The pad assembly of claim 1 wherein the non-planar surface of the backing member is shaped to provide an approximately uniform-thickness portion of the compressible layer when a compression force is applied to the first surface during an exercise.

7. The pad assembly of claim 6 wherein the approximately uniform-thickness portion is co-extensive with a portion of the first surface adapted to engage the portion of the user's body.

8. The pad assembly of claim 1 wherein the non-planar surface of the backing member is shaped to provide an approximately uniform-pressure portion when a compression force is applied to the first surface during an exercise.

9. The pad assembly of claim 1 wherein the backing member comprises a coupling assembly adapted to attach to an exercise machine.

10. The pad assembly of claim 1 wherein the backing member comprises a contoured backing plate.

11. The pad assembly of claim 1 wherein the backing member comprises an axisymmetric member.

12. A pad assembly for an exercise machine, comprising:  
a compressible member having a first surface adapted to engage a portion of a user's body and a second surface opposite from the first surface, the second surface being adapted to engage a contoured backing surface such that a compression force applied to the first surface provides an approximately uniform-thickness portion of the compressible member between the first surface and the contoured backing surface.

13. The pad assembly of claim 12 wherein the second surface comprises a depressed portion adapted to fittingly engage at least a portion of the contoured backing surface.

14. The pad assembly of claim 12 wherein the contoured backing surface comprises a contoured pad support projecting from a moveable portion of the exercise machine.

15. The pad assembly of claim 12 wherein the approximately uniform-thickness portion is co-extensive with a portion of the first surface adapted to contact the portion of the user's body.

16. The pad assembly of claim 12 wherein the contoured backing surface comprises a contoured portion having a radius of curvature within the range from approximately 1.5 inches to approximately 7.0 inches.

17. The pad assembly of claim 12 wherein the compressible member comprises a polyurethane member.

18. The pad assembly of claim 12 wherein, when the compressible force is applied, the compressible member provides a first surface approximately corresponds with an anticipated shape of the portion of the user's body.

19. A pad assembly for an exercise machine, comprising:  
a layer of compressible padding having a first surface adapted to engage a portion of a user's body and a second surface opposite from the first surface; and  
a backing structure attached to the layer of compressible padding and having a backing surface proximate the second surface, the backing surface being shaped to provide an approximately uniform-thickness portion of the layer of compressible padding when a compression force is applied to the first surface.

20. The pad assembly of claim 19 wherein the backing surface is contoured such that the compression force is approximately uniformly distributed over the first surface.

21. The pad assembly of claim 19 wherein the approximately uniform-thickness portion is co-extensive with the first surface.

22. The pad assembly of claim 19 wherein the backing surface comprises a contoured portion having a radius of curvature within the range from approximately 1.5 inches to approximately 7.0 inches.

23. The pad assembly of claim 19 wherein the backing structure comprises a channel attached to the backing structure opposite from the layer of compressible padding and adapted to attach to a support portion of an exercise machine.

24. An exercise machine, comprising:  
 a support frame having a fixed portion and a moveable portion moveably coupled to the fixed portion;  
 a load operatively coupled to the moveable portion;  
 at least one pad assembly attached to the support frame, the pad assembly comprising:  
 a layer of compressible padding having a first surface adapted to engage a portion of a user's body; and  
 a backing member attached to the layer of compressible padding and having a backing surface engaged against the layer of compressible padding opposite from the first surface, the backing surface being at least partially contoured.

25. The exercise machine of claim 24 wherein the backing surface is contoured such that a compression force applied against the first surface provides an approximately uniform-thickness portion of the layer of compressible padding between the backing surface and the first surface.

26. The exercise machine of claim 25 wherein the backing surface is contoured such that the approximately uniform-thickness portion is co-extensive with a portion of the first surface adapted to contact the portion of the user's body.

27. The exercise machine of claim 24 wherein the backing surface comprises a contoured portion having a radius of curvature within the range from approximately 1.5 inches to approximately 7.0 inches.

28. The exercise machine of claim 24 wherein the backing surface is contoured such that, when a compression force is applied against the first surface, the first surface is adapted to provide an approximately uniform pressure distribution on the portion of the user's body.

29. The exercise machine of claim 24 wherein the moveable portion is pivotably coupled to the fixed portion, further comprising coupling means for moveably coupling the moveable portion to the load so that movement of the moveable portion is resisted by the load.

30. An exercise machine, comprising:

a support frame having a fixed portion and a moveable portion moveably coupled to the fixed portion;

a load coupled to the moveable portion by a coupling means for moveably coupling the moveable portion to the load so that movement of the moveable portion is resisted by the load;

a support surface attached to the support frame proximate the moveable portion, the support surface being adapted to at least partially support a user's body;

at least one pad assembly attached to the support frame proximate the support surface, the pad assembly comprising:

a compressible member having a first surface adapted to engage a portion of the user's body and a second surface opposite from the first surface, the second surface being adapted to engage a contoured backing surface such that a compression force applied to the first surface provides an approximately uniform-thickness portion of the compressible member between the first surface and the contoured backing surface.

31. The exercise machine of claim 30 wherein the contoured backing surface comprises a contoured pad support projecting from a moveable portion of the exercise machine.

32. The exercise machine of claim 30 wherein the approximately uniform-thickness portion is co-extensive with a portion of the first surface adapted to contact the portion of the user's body.

33. The exercise machine of claim 30 wherein the contoured backing surface comprises a contoured portion having a radius of curvature within the range from approximately 1.5 inches to approximately 7.0 inches.

34. The exercise machine of claim 30 wherein, when the compressible force is applied, the compressible member provides a first surface approximately corresponds with an anticipated shape of the portion of the user's body.

35. The exercise machine of claim 30 wherein the moveable portion comprises a leg yoke and the pad assembly comprises a leg pad assembly attached to the leg yoke.

pressing a portion of a user's body against the first surface to compress the compressible layer between the portion of the user's body and the non-planar backing surface and to form an approximately uniform-thickness portion of the compressible layer therebetween.

37. The method of claim 36 wherein pressing a portion of a user's body against the first surface to compress the compressible layer comprises pressing a portion of a user's body against the first surface to form an approximately uniform-thickness portion of the compressible layer that is co-extensive with the portion of the user's body.

38. The method of claim 36 wherein pressing a portion of a user's body against the first surface to compress the compressible layer comprises pressing a portion of a user's body against the first surface to form an approximately uniform-pressure distribution on the portion of the user's body.

39. The method of claim 36 wherein pressing a portion of a user's body against the first surface to compress the compressible layer comprises pressing a portion of a user's leg against the first surface.

40. The method of claim 36 wherein pressing a portion of a user's body against the first surface to compress the compressible layer comprises pressing a portion of a user's arm against the first surface.

41. The method of claim 36 wherein pressing a portion of a user's body against the first surface to compress the compressible layer comprises pressing a portion of a user's shoulder against the first surface.